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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,865	02/20/2006	Nobuaki Mitamura	126363	5511
25944	7590	07/03/2006	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			HITESHEW, FELISA CARLA	
			ART UNIT	PAPER NUMBER

1722

DATE MAILED: 07/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/561,865	Applicant(s) MITAMURA ET AL.	
	Examiner Felisa C. Hiteshew	Art Unit 1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-31 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 12-17 and 24-31 is/are rejected.
- 7) ☒ Claim(s) 18-23 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The Information Disclosure Statement under 37 C.F.R. 1.97 has been received and reviewed. However, the information disclosure is not deemed to be pertinent over the prior art of record.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 12-17 and 24-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurada, et al (U.S. Patent No. 6,913,646 B2) and Fusegawa, et al (U.S. Patent No. 6,562,662 B2).

Sakurada, et al '646 B2 teaches a MCZ method for producing a silicon single crystal, wherein there is a relationship between a pulling rate of the single crystal and a temperature gradient G near a solid-liquid interface of the crystal. When a crystal is pulled with decreasing a pulling rate V gradually, the crystal in which the N region spread horizontally over the whole plane can be obtained at a certain pulling rate (see column 1, lines 49-57 and column 2, lines 47-68). Sakurada, et al '646 B2 also teaches a defect-free silicon single crystal wafer grown according to the Czochralski method wherein the whole plane of the wafer is occupied by N region on the outside of OSF generated in a shape of a ring by thermal oxidation and there exists no defect region detected by Cu (copper) deposition. (See column 3, lines 20-68).

The difference being that Sakurada, et al '646 B2 does not exactly teach a method for producing a single crystal wherein the pulling condition is changed so that the margin of the pulling rate always satisfies a relational formula "the margin of the pulling rate $\geq 0.35 \times \exp(-0.016 \times \text{a diameter of a straight body of the single crystal [mm]}) = 0.01$ " and wherein the pulling condition to be changed is at least any one of a distance between a melt surface of the raw material melt and a heat insulating member provided in the chamber, etc.

Fusegawa, et al '662 B2 teaches a method for manufacturing a silicon single crystal from a silicon melt by a MCZ method performing single crystal pulling under

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application of a magnetic field, but also a flow rate of and inert gas flowing in the growth furnace during growth of the silicon single crystal and/or a pressure in the growth furnace is altered according to a pulling amount of the silicon single crystal to adjust an interstitial oxygen concentration therein. The oxygen concentration in a silicon single crystal obtained by a CZ method is restricted to a predetermined level or less during pulling of the silicon single crystal. The oxygen concentration is stabilized while suppressing convection in a melt with adoption of an MCZ method. The flow rate of an inert gas flowing in the growth furnace along with the pressure in the growth furnace is altered according to a pulling amount of the silicon single crystal; thereby enabling a suppressed level of variation is to be realized. It would have been obvious to one of ordinary skill in the art to modify and optimize the process parameters, as taught by Sakurada, et al '646 B2, by the similar process parameter teachings, as taught by Fusegawa, et al '662 B2. The motivation being that the electrical characteristics such as oxide dielectric breakdown voltage can be controlled under stable manufacturing conditions.

Allowable Subject Matter

5. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).
6. Claims 18-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Felisa Hiteshew whose telephone number is (571) 272-1463. The examiner can normally be reached on Mondays through Thursday from 5:30 AM to 4:00 PM with Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta, can be reached on (571) 272-1316. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-1463.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866- 217-9197 (toll-free).


Felisa Hiteshew
Primary Patent Examiner
Art Unit 1722